

FACTORS THAT FOSTER THE EVOLUTION OF A LEARNING SOCIETY

BY

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The Idea of a Learning Society

A learning society cannot be built. It grows. It evolves. The conditions that foster the evolutionary process are, like for any other such process, multiple and diverse. A society in which learning is ubiquitous, i.e. in which learning pervades all aspects of life and in which learning manifests itself at different levels of social organization, ranging from the individual to society at large, is by nature something of which the overall behavior is, in a complex way, dependent on the behavior of the different entities that constitute the whole. Some keywords in the previous sentence are *entity*, *whole*, *complex*, and *learning*. Let us look at what they mean. I start with the last word and then work backwards.

Learning

There is much confusion about learning. For many people the word is closely – and often almost exclusively – related to what goes on in the school or similar instructional settings. In their perception, it has to do predominantly with acquiring some skill or a specific pattern of behavior, or with becoming familiar with particular pieces of knowledge. So, one learns to swim; ride a bicycle; speak a foreign language; read and

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write in the mother tongue; become well behaved according to the prevailing norms; and interpret one's environment and the operations that occur in it (e.g. commercial ones) in quantitative terms, being able to relate them mathematically. No doubt, such things are useful and often even essential in today's world. Yet, this is not all there is to say about learning. A learning society is not simply a society in which everyone is able to follow all possible courses and attend all possible educational institutions for purposes like the above ones.

Another misconception about learning is that its most important dimension is what happens inside us, particularly what happens inside the brain and more specifically the neocortex. Some of the excitement about the recent findings in the field of neuroscience seems to contribute to such a bias in our thinking. No doubt, our brains are important, but they are not the only part of our bodies that gets engaged when we learn. School-based pedagogical practices often assume that what is really important about human beings is not the integrity of their selves, but rather the superiority of those parts of their nervous system that came last in the evolution. If such practices still have some success, then it is despite this emphasis and not because of it. It is particularly frightening to see how such a narrow view of learning almost totally separates the concern with people's reasoning power from their emotions.

In an earlier Vimukt Shiksha contribution (J. Visser, 2000), as well as in a chapter for the forthcoming International Handbook of Lifelong Learning (J. Visser, in print), I have referred to learning as a disposition, more specifically, as a disposition to dialogue. That dialogue is the essential means through which we become an integrated part of everything that surrounds us, through which we are able to recognize our place in the universe. Unlike other life forms, humans have a highly developed capability of consciousness. They do not merely act and react to what happens around them, they also observe themselves doing so, leading them to reflect on what they do and on its consequences, pondering questions it raises in them. The reductionist tendency in the tradition of disciplined inquiry has largely ignored investigating such a complex

LEARNING UNDEFINED

"Human learning is the disposition of human beings, and of the social entities to which they pertain, to engage in continuous dialogue with the human, social, biological and physical environment, so as to generate intelligent behavior to interact constructively with change."

From: Visser (in print). (Emphasis added.)

phenomenon as consciousness. I believe it is highly necessary to correct this and to bring to bear on this area emerging insights into the validity and relevance of transdisciplinary approaches, expressed, among other fields, in the study of complexity. This brings us to the next item on the list of terms to be clarified.

Complexity

Like in the case of learning, there is also quite some confusion surrounding the term complexity. This is partly caused by the difficulty of the concept itself. We use the word ‘complex’ in everyday language and think we have a fair idea of what it means. The idea we have of it is indeed probably sufficient for our everyday communication about situations we perceive as complex. There are similar problems with such concepts as ‘heat’ and ‘energy.’ These, too, are everyday words with everyday meanings that create a lot of confusion when one starts to deal with those same notions in the context of the physical sciences. The literature that popularizes these concepts can do a lot of good in enhancing understanding. Sometimes, however, such literature ends up in the hands of sloppy readers. In such cases no great harm occurs as long as those readers are not at the same time authors.

Another problem, of course, is that researchers in the area of complex adaptive systems, in their zeal to be precise, and often reluctant to retreat from previous formulations, sometimes adopt different terminologies to say the same thing or say different things using the same words. Gell-Mann (1995) explains the all too human background of this tendency, referring to the old saying that “a scientist would rather use someone else’s toothbrush than another scientist’s nomenclature” (p. 18).

The scope of this article does not allow exploring the issue of complexity in depth. However, excellent sources on the matter are Gell-Mann’s (1994) “The quark and the jaguar: Aventures in the simple and the complex” and Axelrod and Cohen’s (1999) “Harnessing complexity: Organizational implications of a scientific frontier.” What matters in considering the learning society as a complex adaptive system is the need to distinguish clearly between randomness on the one hand and complexity on the other hand. Gell-Mann argues that the way such systems – and for that matter the learning society – learn and evolve, requires, among other things, “the ability to distinguish, to

some extent, the random from the regular”(p. 50). Typically, a learning society is made up of all kinds of complex subsystems (human individuals represent but one level of such subsystems). All those subsystems are themselves complex adaptive systems in their own right. They interact with each other and interpret each other in terms of what is regular in them and what is random. At the heart of the issue of effective complexity is, to quote Gell-Mann, the difficulty to describe “the regularities of a system by a complex adaptive system that is observing it” (p. 50). Or, as Axelrod and Cohen emphasize with reference to Gell-Mann’s position: “A system should be called complex when it is hard to predict not because it is random but rather because the regularities it does have cannot be briefly described” (p. 16).

The recognition that we, as humans, are complex adaptive systems among many other such systems – each exploring randomness and regularity among all the others with which they interact – is reason to be modest and to recognize our own importance as relative to our environment. It should give us a sense that what we are, what we seem to know, is as much a function of our own capacity to undertake these explorations in the random and the regular as that it depends of the affordances of the environment of complex adaptive systems with which we interact and, in the process of our interaction, become part of.

This is a notion that challenges our ability to understand the world in ways that we have grown used to thanks to centuries of scientific inquiry based on taking the world apart, looking at and understanding some of its detail, but never being able to take account of phenomena that emerge when things are put together again and the whole becomes more than the collection of its isolated parts. A crucial aspect of complex adaptive systems is that they are composed of entities, usually called agents, that interact with each other. It is not the fact that there are *many* such agents that makes a system complex. Rather, it has to do with the nature of interactivity in the system as a whole. That interactivity is such that “current events heavily influence the probabilities of *many kinds of later events*” (Axelrod & Cohen, 1999, p. 7, my emphasis). This allows properties of the system as a

*“For us . . . complexity indicates that the system consists of parts which interact in ways that heavily influence the probabilities of later events. Complexity often results in features, called **emergent properties**, which are properties of the system that the separate parts do not have.”*

From: Axelrod and Cohen (1999, p. 15)

whole to emerge that cannot be explained in a simple manner on the basis of its constituting entities considered in isolation. This then brings us to the discussion of the remaining two terms, the meaning of which I had previously suggested would require further elucidation.

Entities and wholes

I take these two terms deliberately together, because they belong together. We cannot speak of a part, an entity, without implying that there is a whole. Similarly, it makes no sense to introduce the concept “whole” without, at the same time defining it in relation to its constituting parts. As mentioned before, complex adaptive systems are often made up of smaller complex adaptive systems (aggregates of agents, or, as Holland [1995] calls them, meta-agents). What, from the perspective of the larger complex adaptive system, is one of its parts, may, from its own perspective, be complete, an autonomous entity that functions within context. That same entity may, in turn, serve as the context for all kinds of other smaller entities, perceived as complete in their own right, yet interdependent in ways that give rise to the larger entity, equally displaying the properties of a complex adaptive system, but at a higher level. Interdependence, then, is what gives sense to the dialectic relationship between parts and wholes, between entities and their contexts. Such interdependence generates flows of all manner of things among entities at a particular level of organizational complexity as well as between different levels of organizational complexity. In the case of the learning society, seen as a huge conglomerate of people and social entities that are in continuous dialogue with each other, one of those flows is clearly a flow of information. However, it is important to consider that such information flow is a function of the developing interaction and not a predetermined feature of its overall design.

“There is no unique way to describe an ecosystem.... Meta-agents are aggregates of agents and of smaller meta-agents, and themselves may be bundled into even larger mega-meta-agents. Any system is a mess of overlapping hierarchies of aggregations, limited in any particular description only for the convenience of the observer. For any such simplification of a system’s overwhelming complexity, however, there will be flows among meta-agents, as well as flows within.”

From: Levin (1999, p. 14)

The Learning Ecology

Learning, the way it was defined earlier on in this article, namely as a disposition to dialogue for constructive interaction with change, is an ecological phenomenon. Entities, from human individuals to the world at large, interact with change at different levels of organizational complexity. They do so, not in accordance with some sort of grand design, but rather – each entity at its specific level of organizational complexity – by being responsive to their immediate environment, following often relatively simple rules of interaction.

As holds true for any ecology, the learning ecology thrives on diversity. Learning and growth (growth is what constructive interaction with change results in) belong together in an evolutionary sense, the essence of evolution being that “chance and choice, given enough time, make a powerful combination for change” (Levin, 1999, p. 18). Diversity is essential to allow what Axelrod and Cohen (1999) call “the three key processes in a Complex Adaptive System,” namely *variation*, *interaction* and *selection*, to effectively do their job and contribute to growth. It is therefore important to ensure that the conditions of learning that a society creates foster diversity and thus evolution. Hereafter I shall discuss a number of those conditions.

Factors that Foster the Evolution of a Learning Society

Multiple factors promote and maintain the disposition to dialogue for constructive interaction with change and allow it to develop throughout society. Some of them are relevant at the level of individual human beings, other factors are relevant for learning that takes place at higher levels of organizational complexity, and yet other factors have to do with how people and social entities interact and fit together organizationally. The prevailing culture of schooling tends to direct societal resources – creative, intellectual, and financial ones – towards hard and soft infrastructure that emphasizes the kind of learning we engage in while being part of organized instructional contexts. It also tends to bias the allocation of resources to the age group commonly referred to as that of the school age. Such a bias is counter to the previously discussed need to foster diversity. A

true learning society, therefore, must have a much broader concern with the conditions of learning. It must also recognize that establishing such conditions involves society as a whole and not merely the government entities that have been made responsible for running the school system. In other words, the citizenry at large, their communities, the media, corporate entities, and government ministries, to name but a few, they all play a role and they must play their various roles together and often at different levels.

Shifting the emphasis away from an almost exclusive focus on centralized control and intervention is part of the process to broaden society's focus on the conditions of learning. However, decentralization is not a panacea. "Decentralization is both promising and problematic" (Axelrod & Cohen, 1999, p. xiv) and self-organization, however much needed as a means to overcome some of the ills of centrally directed societal organization of the past, is not the only thing that makes human society tick.

Keeping the above observations in mind, here are some areas where I believe important factors reside that give rise to a learning landscape that is more harmonious and beautiful than the one we know now.

The family

At the individual level, learning begins nine months before we are born and it continues until we die. To the extent that we are all part of the social and historical processes that contribute to the continual development of an increasingly complex body of human knowledge, learning also extends beyond our physical existence. At the time we come into the world, much is already there, embodied in the cultures we are born into, but embodied also in what evolution has equipped us with, our capacity to develop the brain structures that will remain with us as long as we live and that we may further develop in the course of our lives. It so happens that the most important phase of our neural development takes place shortly after birth. The way it happens is highly dependent on the circumstances we encounter during that period. Those circumstances relate to important physical health factors, including nutrition, as well as to how infants are able to interact with their

"Walk upstairs, open the door gently, and look in the crib. What do you see? Most of us see a picture of innocence and helplessness, a clean slate. But, in fact, what we see in the crib is the greatest mind that has ever existed, the most powerful learning machine in the universe."

From: Gopnik, Meltzoff and Kuhl (1999, p. 1)

environment. Infants who remain deprived of human interaction at those early stages seriously suffer, on a prolonged basis – indeed, for a lifetime – of such lack of attention. The family is the foremost environment in which we learn to learn, an environment in which we encounter other human beings in interaction with whom we get to know ourselves in relation to the world around us (see e.g. Gopnim, Meltzoff & Kuhl, 1999 and Bransford, Brown & Cocking, Eds., 1999 [particularly Chapter 4]).

In this area, responsibility for creating the factors that foster learning, and by extension to help building the learning society, resides undoubtedly in the first place with the parents to whom a child is born and the immediate community of which those parents are a part. However, families don't stand on their own. The extent to which they are able to function well and serve as the starting point for any newborn's learning life, depends on all manner of circumstances, e.g. economical, social, and cultural, that surround the family. This is where we can see that even the establishment of such apparently individual factors is very much the result of the collaborative exercise of responsibility at many different levels in society.

Here's how Murray Gell-Mann, Nobel Prize winning physicist, begins a description of how he is indebted for what he learnt to his family, his city, and nature:

"I owe most of my early education to my brother Ben, who is nine years older. It was he who taught me to read when I was three (from a Sunshine cracker box) and who introduced me to bird and mammal watching, botanizing and insect collecting. We lived in New York City, principally in Manhattan, but nature study was possible even there. I thought of New York as a hemlock forest that had been logged too heavily..."

From: Gell-Mann, 1995, p. 12

The family is, obviously, a beautiful example of a self-organizing system. Its position at the very beginning of any individual's learning life, as well as the role it can continue to play throughout life, thus constitute an important basis for the continued regeneration of diversity. That capacity to regenerate diversity is at risk when forces that tend towards uniform patterns of interaction interfere with family life. We are all familiar with such forces that result from models presented by the mass media or advertising campaigns. Other such forces may come into play when children reach the school age and families start to become overly responsive to rigid demands of the school system.

Instructional settings

The idea that human beings should dedicate a specific period, relatively at the beginning of their life, to preparing themselves for the remainder of it by engaging

predominantly in learning during most of that period, has been with us for a long time. It wasn't a particularly bad idea as long as it was still possible to cope with life's challenges and respond to life's opportunities with the basic set of skills, attitudes, and knowledge that was supposed to result from this preparatory learning experience. However, that time is over.

Naturally, during the era of industrialization, the way in which that initial preparatory learning experience was being facilitated and taken care of, became modeled after similar processes as those by which, for instance, cars could be produced. The positive side of this was that, in principle – and provided the system was managed adequately – large groups of young people could receive the same opportunities to learn, resulting in a more equitable and just participation of individual citizens in society. The downsides of the system are also well known and have been the object of fundamental critique for probably as long as the schooling system has been in place.

At the current juncture in time, our focus should no longer be, in the first place, on what is wrong with the practice of schooling and how its ills could be repaired. Rather, the question is whether anything like industrial-age schooling is relevant at all. And the answer is 'No.' In a world that abounds with change, anyone's future has become unpredictable, except for the certainty that one will always have to be prepared for the unpredictable. This realization squarely points away from the predominant pedagogical paradigms in the direction of processes that recognize people's particular individuality, including as it relates to their emotional and intelligence make-up and their preferred styles of learning and thinking. It also points towards the ability to learn and to develop one's prowess at learning as one of the most important factors to live a fulfilled life.

"In the education of scientists, one is accustomed to the need to develop the ability to function in entirely unpredictable situations, for such is the nature of scientific exploration. This points to a search for educational processes that will strive for the capability of adapting, and even thriving in areas of new problems and new opportunities. Schools must look across all disciplines, across the knowledge base of the sciences, across the wisdom of the humanities, the verities and explorations of the arts, for the ingredients that will enable our students to continually interact with a world in change, with the imminence of changes bringing essentially unforeseeable consequences. Obviously, a vital component of such education is the habit of life-long learning."

From: Lederman (1999)

In addition, and due to the much greater interdependence in today's world among human beings, the concept of individuality has been greatly enhanced as it now more strongly relates to individuals' social integration. Consequently, the emphasis in traditional pedagogical practice on the individual in isolation must make place for ways of facilitating learning that recognize the essential importance of human collaboration. In other words, the design of structured instructional contexts must as much be based on considerations of the learning needs of individuals *per se* as it must take account of learning needs that can only be conceptualized in the framework of the learning community.

Another important way in which instructional settings must adapt to today's reality has to do with our changing views of cognition. We live in a complex world of potentially multiple consequences. To effectively interact with that world we must be able to apprehend its inherent complexity, we must know and appreciate it as a complex world. This is difficult, if not outright impossible, if we continue the practice, still so strongly present in many schools around the globe, that emphasizes specialized knowledge in isolated disciplinary areas over a focus on problems, thus ignoring the concern with learning processes based on people's interaction with problems. This is not, though, an area for either/or choices. Being able to argue in a disciplined fashion is very important. However it is at risk of becoming irrelevant, or even dangerous, if not at the same time the capacity is developed to deal with real problems and to appreciate the fact that no vision of the whole can be obtained by adding up the views generated by individual disciplines. Structured instructional processes must focus on creating expertise, rather than specialization. While these concepts are often confused, I refer readers to Bransford, Brown and Cocking (1999), particularly Chapter 2, for further elucidation on this issue.

"The ability to monitor one's approach to problem solving – to be metacognitive – is an important aspect of the expert's competence. Experts step back from their first, oversimplistic interpretation of a problem or situation and question their own knowledge that is relevant. People's mental models of what it means to be an expert can affect the degree to which they learn throughout their lifetimes. A model that assumes that experts know all the answers is very different from a model of the accomplished novice, who is proud of his or her achievements and yet also realizes that there is much more to learn."

From: Bransford, Brown and Cocking, 1999, p. 38

The state of technology as well as of our knowledge of multiple ways to facilitate people's learning through instruction is such that structured instructional settings are no longer bound by physical parameters. The reality of distance education is but one expression of the multi-modal nature of instruction. Unfortunately, when such alternatives as distance education, or the current forms of digital technology-enabled learning, now frequently referred to – with an astounding lack of imagination – as e-learning, become available, it often happens that past practices are simply recast in new molds, sadly missing the opportunity to explore the inherent prospects for fundamental change. Current discourse, inspired by undoubtedly well-intended maxims such as 'Education for All,' reinforces the tendency to look in narrow ways at the challenges of building the instructional landscape of the future. Problems get defined in terms of means – such as lack of schools or teachers – and no questions are asked about the ends that those means are supposed to serve. A radical change of rhetoric is required if one wants to avoid, like has happened so often, that new opportunities are wasted because they are merely exploited to reinforce and consolidate bad practice.

I round this section off by saying two things. First of all, I believe that there should be ample opportunity for young people to dedicate a large part of their life – say to somewhere around the age of 20 – to learning. As part of that vision, I believe that the existence of structured instructional contexts is an important factor to make such learning possible. However, I also believe that it would be very bad if those structured instructional contexts would not be radically different from what goes on in most of our current schools. Moreover, important opportunities would be missed if, during that early phase in a human being's life, learning were left entirely or predominantly to those structured instructional settings. Important as they are, they are not sufficient. The family environment, mentioned above, is but one complementary learning context. Virtually anything can offer tremendous opportunities for learning. Thus, other complementary learning contexts are afforded by, for instance, the city or village in which people live; the popular culture of which they are part; the grief and humor they share; the media to which they expose themselves; the libraries and museums they interact with; the games they play and toys which they interact; the music they make and the dances they participate in; the stories they tell; the flea markets, waste dumps, and places of

industrial, agricultural, or commercial activity they explore; the Internet-enabled interactive environments they become involved in; or their shared amazement at the wonders of nature.

The second thing I want to say is that structured instructional contexts are not only one of the important mechanisms through which entire generations of young people may enrich their lives, they are equally relevant at any age, considering that learning is an unending process. As a factor to foster the evolution of the learning society it is thus important to contemplate individual instructional settings as part of a comprehensive instructional landscape, in which they harmoniously fit together. That instructional landscape is something very pluralistic. It provides a habitat for people of all ages whose circumstances, needs, and desires may widely vary. Thanks to a now well-developed instructional design tradition, much is known about how such settings can best be shaped. The same tradition, however, is less well prepared, and should thus further develop, to face the challenges imposed by the need to look at the instructional landscape in a comprehensive fashion.

The media

In singling out the media as an important factor in fostering the evolution of a learning society, I do not in the first place think – actually, I’ve hardly thought of it at all – of their role in creating specific intended learning opportunities, such as when radio, print, TV, or the Internet are used in support of school-based learning or in the context of distance education alternatives. That role is well known and of recognized importance. However, it is part of the overall context of instructional settings described above. Its value in these settings as well as the critique of its use should be discussed with reference to the same standards that apply to judging such instructional settings if they were of a more conventional nature. In other words, there is much in such media use that shows the same flaws that can also be found in the traditional school context, such as emphasis on rote learning of unconnected pieces of knowledge through instructional procedures that emphasize information transfer over deep learning. On the other hand, there are also excellent examples of media use for deliberately designed instructional purposes that

result, for instance, in the development of critical attitudes and skills to deal autonomously, within a community context, with real-life problems.

Here, however, I want to leave the above issues for what they are and concentrate on other aspects of the role of media that impact on the evolution of a learning society. Media are powerfully present in today's world. To the extent that individuals interact with them directly, by listening to the radio, watching TV, reading the output of the printing presses, or using the Internet, the immediate impact of those media depends on whether, and how effectively, they reach people in particular regions of the world. While their coverage may be extensive, it is, with the exception perhaps of radio, far from worldwide. Nonetheless, media coverage around the globe is gradually expanding; a phenomenon that is better taken into account in any future-oriented vision of the role media can play in the evolution towards a learning society. Though large parts of the world currently remain out of reach of such media as the Internet or TV, or even the press, this does not mean that the lives of individuals in those areas remain untouched by them. In such cases, the impact of media is indirect. There are few countries, if any, where the leadership would not be profoundly influenced, positively or negatively, by their exposure to worldwide satellite broadcasts or their ability to access the Internet and to read books and newspapers. Through them, others are affected as well.

Media play an important role in positioning issues and spawning debate around those issues. Debate generates discourse and discourse shapes thought processes. Established discourse influences people in their perceptions of what is and what is not important. Media therefore have an impact on the social dialogue and thus on the broad context in which learning takes place. Many of the instructional settings referred to above interact with and become influenced by the media. Another important setting for learning mentioned earlier, the family, may, in some cultures, be profoundly affected by the media as well.

The influence of the media should not be seen as a boundary condition for the learning environment, something like a given that no one can change, except the media themselves. Allen and Otto (1996) thus refer to media as "lived environments" (pp. 199-225). Media are a dynamic component of the learning landscape. At least, that's what they could be or should be, even though in many cases their management and

programming are strongly dominated by external forces, often of either a political or a commercial nature, and sometimes a combination of both. It is therefore important that the attitude of the public *vis-à-vis* the media change from that of passive consumers to that of critical users whose constructive interaction with the media should increasingly start determining what the media landscape – like the instructional landscape a sub-landscape of the learning landscape – will look like and how it develops. Only then can the media truly play a role in elevating cognition to a level that transcends what goes on inside the heads of individual people, emphasizing the cognitive resources that reside in the socio-cultural milieu (see also Cole & Engeström, 1993).

Critical engagement of the public with the media is necessary to mitigate the otherwise unidirectional influence of what may sometimes look like an onslaught of the global media on local cultures and knowledge systems, considering their tendency to impose the language, patterns of reasoning, values and icons prevailing in one part of the world on the rest of it. For such critical engagement to work well, it is important that there be a well-developed ecological integration in the media landscape, meaning that global systems organically interact with systems that organize themselves at more localized levels such as countries, regions and communities. (A similar argument holds true for the instructional landscape, in which more and more players start operating on a global scale, as well as in the socio-cultural landscape, of which the family is a part.) Without critical engagement of the public and without sound ecological flows between media operations at different levels of organizational complexity, there is the considerable risk that global media result in increased uniformity and in the gradual disappearance of diversity among the cognitive resources of the socio-cultural milieu.

Thus, the development of local media, such as community radio, village video, local press and community libraries, is important. Current technology has made it possible for local initiatives in this area to be developed on a shoestring basis. The World Wide Web is an interesting case in its own right. The spread of the Internet around the globe positions it clearly as an environment potentially suited for worldwide communication. However, nothing, least of all the cost of running a Web site, determines that it can only be used on a global scale. Quite to the contrary, many Web-based operations are deliberately designed to serve a small group of people only. They thus

allow community building around local and specific interests. On the other hand, the ability to create hypertext links among Web pages, allows local activity to become visible and organically integrated in larger networks. The Web is therefore an interesting environment to contribute to the goal of organic integration of the media landscape.

The Bigger Question: The Meaning of Learning

In the previous sections the emphasis has been on three areas whose development, as this article argues, can have a considerable impact on how the learning society evolves. That impact can be both positive and negative, depending on how those factors develop. The scope of this article does not allow exploring multiple other factors. Instead, I will use this final section to raise the question of what broad issues should receive particular attention in the development of learning and what such attention should imply.

For almost a year now, the Learning Development Institute (LDI) has been asking people to tell their learning stories. Prospective authors were approached with three simple questions: “What is your most meaningful learning experience?” “Why should that particular learning experience be considered meaningful?” “What were the key conditions that allowed that learning experience to occur?”

Results of research carried out on these learning stories were recently (October 2000) presented at the International Conference of the Association for Educational Communications and Technology in Denver, Colorado (Y. L. Visser & J. Visser, 2000). Several universities have since joined LDI to expand the effort and improve the database. The research results presented during the Denver meeting reveal that people perceive their learning as meaningful when any or more of the following things happen:

- Learning results in ownership of knowledge (i.e., it involves autonomous processes of making decisions, choices, guesses, mistakes and discoveries, and developing the various emotions that accompany those processes).
- Learning is maintained across the lifespan (i.e., any particular learning experience is perceived as an integral part of one’s lifelong involvement in learning).
- Learning lays the path for continued growth (i.e., learning is generative).

- Learning has implications in the real-life context (i.e., it is seen as inherently relevant).
- Learning results from the active involvement in facilitating someone else's learning (such as when a teacher discovers that his or her efforts to share experience with someone else are rewarded by a deepening of his or her own understanding).
- Learning changes negative self-perceptions into positive ones (The formulation of this finding should be interpreted against the backdrop of the initially negative experience many of the contributors to the learning stories project have had with the perceptions imposed on them by the traditional school system).
- Learning results in the discovery of persistence as a strategy to manage life's challenges (indicating the importance of situating learning in the context of serious long-term pursuits).

Such learning was found to be particularly facilitated when:

- An initially negative condition could be transformed into a positive challenge.
- A role model was present or emotionally significant support was available in the environment of the learner.
- There were opportunities for independent exploration of one's learning and metacognition.

Very few of the learning stories that were collected made any direct reference to the school context. Among those that did, only a small proportion reported positively about the school. The larger proportion represented stories

The following text is adapted, by way of example, from the learning story of Rodolfo, a Mexican boy,

the one who took the world apart

From a very early age onward, Rodolfo had the habit to dismantle anything mechanical he could lay his hands on. Mechanical things looked like they had some life in them. He dismantled them even though he knew that his behavior would almost certainly result in severe punishment from his parents. Rodolfo took things apart to find out why and how they worked. At the same time it allowed him to construct ideas that pertained to his world of fantasy. Thus he was able, for instance, using the parts of things he had previously dismantled, to build a 'movie' projector using an old shoebox. In the process he became aware of physical principles, not realizing that those things would normally only be taught at the bachelor level.

Punishment did not deter Rodolfo. His curiosity and interest only increased the more sophisticated the things he continued to take apart. They included, when he had reached the age of 12, those new radio receivers with 'bulbs' on them. In trying to understand how they worked he experienced electric shocks and could see sparks flashing when connecting different points with pieces of metal. He also discovered that generally, when a radio didn't work, it was because one of those bulbs was somehow damaged and did not glow the way it should. This became the key to turning punishment into reward. Henceforth, Rodolfo would repair radios and all kinds of other things, making a little profit.

Taking things apart has remained Rodolfo's preferred way of learning. Had it not been for the poverty and the scarcity of the environment in which he grew up, his creativity and sense of exploration might never have been challenged so much and he might never have discovered his secret to learning.

of survival, i.e., stories of people who had been able to overcome the negative impact of the school environment on them and therefore, as mentioned above, to turn this initially negative condition into a positive challenge.

While the research effort continues and a more detailed and complete picture emerges, current results point in the direction of issues that get surprisingly little attention from the community of people who purport to advance the cause of learning. The perspective of such people is normally that of the formal contexts and procedures through which we help people to learn, or so we think. The learning processes they deal with tend to emphasize the immediate over the long-term and evolutionary; the definable over the exploratory; and the individual over the social. Does it mean that what they do is all wrong? Well, probably not, but they are likely to be too focused. While there may be lots of things they do correctly, those things would only really start making sense and give meaning to people's lives if they became integrated in a more comprehensive set of conditions. The more overriding dimensions of that set of conditions relate to the integral nature of how the different factors fit together and how they situate learning, at different levels of human and social organization, within the context of an ongoing pattern of activity. That set of conditions should furthermore reflect the historical and evolutionary context of which we are part.

It has always been the premise of educators, educational planners, instructional designers, educational technologists, educational communicators and the like that it is possible to consciously influence people's learning. Research on the effectiveness of instructional events, communication procedures, and technological interventions does indeed support that premise. The bulk of such research, however, has focused on narrowly defined learning tasks rather than the more comprehensive behaviors that the authors of our learning stories emphasize. Emphasis has been on the bricks, making it difficult to see what kind of building resulted from our disconnected actions to add brick to brick. No wonder, then, that the evolution of a learning society has been hampered.

Clearly, the research initiated through the Learning Stories Project focuses on a unit of analysis whose order of magnitude is distinct from that of the more traditional research. Such studies, in combination with comprehensive reviews, like the one undertaken by the National Research Council (Bransford, Brown & Cocking, 1999), that

summarize research in the framework of broad themes, are important. They help create visions of the whole, visions that have long remained obscured by our overriding obsession with detail but that are nevertheless essential to appreciate the beauty and harmony of the evolving learning landscape.

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